PREGNANCY FOLLOWING MYOMECTOMY

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FIBROMYOMAS of the uterus requiring treatment frequently are encountered in nonpregnant women of the childbearing age and occasionally it becomes necessary to treat such tumors surgically, in the course of pregnancy. If one could disregard the childbearing function of the uterus among the former group of patients and the presence of pregnancy in the latter, the problem of treatment in the majority of cases would be solved by the performance of hysterectomy or by the use of irradiation. However, in many cases of fibromyoma of the uterus it is highly desirable to conserve the reproductive function by avoiding the employment of these measures, if this is consistent with the relief of symptoms and with sound surgical judgment. In employing such conservative treatment one must be mindful that the tumor may be unrelated to past or possible future infertility and that myomectomy may not influence favorably the patient's obstetric future. Subsequent to myomectomy, symptoms may occur or myomas may reappear and require surgical treatment or irradiation; also because of the nature of the operation, complications occasionally may develop as they did in four of the cases which we shall consider. Such complications are less likely to occur after hysterectomy.

Interest in these considerations led us to review a group of cases in which women less than forty-five years of age had undergone abdominal myomectomy. We selected 250 cases in which myomectomy was performed between January 1, 1925, and December 31, 1940, inclusive. In all of the selected cases, the patients had been married more than three years and previously had not received treatment which would decrease their fertility. No case was included unless one or more myomas, 1 or more cm. in diameter, were imbedded in the uterine wall. No case of adenomyoma was included.

In twenty-nine of the 250 cases, the patients were pregnant when the myomas were found. Tubal pregnancy was present in four of the twenty-nine cases and myomectomy was performed at the time of tubal resection. In two cases cesarean section and myomectomy were performed at term. In the remaining twenty-three cases, myomec-

tomy was performed in the course of intra-uterine pregnancy. In two of these cases, the fetus was removed by hysterotomy in the course of extensive myomectomy. In seven cases spontaneous abortion occurred after myomectomy. In two cases, premature labor occurred and the infants died. In the twelve remaining cases, the pregnancy continued to full term. In two of these cases, the infants died. One of these deaths was due to hydrocephalus and the other was due to birth trauma.

Fetal mortality is high in cases in which myomectomy is performed in the course of intra-uterine pregnancy. In the twenty-three cases just mentioned and in two cases in which cesarean section and myomectomy were performed at term, twelve infants survived.

In sixteen of the twenty-nine cases in which the myomas were found in the course of pregnancy, the patients subsequently became pregnant and gave birth to twenty-three children.

One of us (R. D. M.) and Hardwick[9] reviewed thirty-two cases in which myomectomy was performed in the course of pregnancy at the Mayo Clinic and found that abortion or premature labor occurred in fifteen of the cases. Pierson[2] reported that abortion or premature labor occurred in 24.1 per cent of 250 cases in which myomectomy was performed. Counseller and Bedard[6] reported similar results.

Few complications occurred in the twelve cases in which intra-uterine pregnancy continued to full term after myomectomy was performed at the clinic. Persistent "spotting" occurred in one case. Cesarean section was performed in one case, because of heart disease. Spontaneous delivery occurred in seven cases. In one case in which the child was delivered through the vagina, the placenta had to be removed manually.

The indications for operation were as follows: Four of the twenty-nine patients were operated on because of ectopic pregnancy. In seventeen cases, operation was performed for a tumor in the pelvis associated with pregnancy. In three of the seventeen cases, the pregnancy was not diagnosed before the operation. Four patients had symptoms caused by degeneration of the fibroids. Uterine bleeding occurred in one case. In one case, operation was performed for an ovarian cyst with a twisted pedicle and uterine myomas. As stated previously, in two cases, myomectomy and cesarean section were performed at full term.

In eighty-two of the 221 cases in which the patients were not pregnant when myomectomy was performed, there was a history of infertility prior to the operation. Eight of the patients subsequently

conceived twelve times (one set of twins) and gave birth to a total of eleven living children.

In seventy-six (30 per cent) of the entire series of 250 cases, significant evidence of myomatous changes in the uterus occurred after myomectomy. In fifty-one of these cases, some form of treatment was necessary. Surgical treatment was employed in forty-two cases and irradiation was used in nine cases.

Of the 250 patients, 101 became pregnant 167 times after myomectomy. One patient became pregnant six times, two became pregnant four times, fifteen became pregnant three times, twenty-five became pregnant twice and fifty-eight became pregnant once. In these 167 pregnancies there were thirty-one abortions, one ectopic pregnancy, three stillbirths, four neonatal deaths and 128 surviving infants, one of whom was premature. One of the neonatal deaths occurred at the twenty-sixth week of gestation; one occurred in a case of placenta previa and one occurred in a case of premature separation of the placenta. In the remaining case, the cause of death was not determined.

In five cases persistent spotting of blood from the vagina occurred during pregnancy. In two of these cases there was great irritability of the uterus which was accompanied by cramping; in all of these cases the pregnancy continued to term. Premature labor occurred in two cases, placenta previa in two cases, delayed postpartum hemorrhage in two cases, and premature separation of the placenta, ectopic pregnancy and circumvallate placenta in one case each. Cesarean section was performed thirteen times. In five cases, it was performed because of the presence of fibroids; in one of these cases a Porro operation was performed. In the remaining cases, cesarean section was performed for reasons other than myomas.

COMMENT

Bonney[1,2], in 1918 and in 1922, and later, W. J. Mayo[7,8] and other authors advised myomectomy, if feasible, instead of hysterectomy in the treatment of uterine myomas in cases in which the patients are women of the childbearing age. To substantiate their statements they reported a significant number of cases in which good results were obtained. In cases of uterine fibromyoma in which the patients are young women, operative treatment commonly is undertaken because of excessive bleeding and an operation sufficiently complete to control this symptom must be performed. It is evident that in many cases the final selection of the type of operation cannot be made until the abdomen has been opened. In some cases, hysterectomy is necessary. Consequently, before the operation is undertaken, the patient

should be informed that the final decision relative to conservation of the reproductive function cannot always be made preoperatively.

Our experience, as well as that of other authors, indicates that myomectomy has very little effect on the course of future pregnancies. In our series of cases, the incidence of complications of delivery increased somewhat, but with modern obstetric and surgical care the increased risk certainly is not prohibitive. As previously stated, in 101 of the 250 cases pregnancy occurred 167 times after myomectomy was performed. In 135 of the 167 instances, the pregnancy continued to term or nearly to term. In twelve, or 9 per cent, of the 135 instances, the child was delivered by cesarean section. It is evident, therefore, that cesarean section was required more frequently than it is in an average group of obstetric cases.

It is difficult to evaluate the role of uterine myomas as a cause of infertility without the benefit of a complete examination of all factors influencing fertility in both men and women. It frequently is not possible to investigate safely tubal patency in the presence of myomas which are producing symptoms. The opinion prevails that the fertility of women decreases in the presence of myomas. The fact that only eight of eighty-two patients who complained of infertility prior to myomectomy subsequently conceived would seem to be in agreement with this statement, although we have no knowledge of other factors which may have contributed to the infertility. It is significant, however, that Brewer and Jones[5] did not find evidence of abnormal physiologic activity of the ovaries in their studies of the corpus luteum and endometrium in cases of uterine myomas.

The term "recurrence" has been applied to the subsequent appearance of uterine myomas after myomectomy. Bonney[3,4] has emphasized repeatedly the incorrectness of this term. Perhaps the term "reappearance" is better than "recurrence." Bonney has said that "recurrences" represent the growth of small myomas that were actually present at the time of myomectomy or the development of entirely new growths. He said that fibroids reappeared in only nine of 379 cases. The explanation of this amazingly low figure is probably due to Bonney's performance of a most complete myomectomy. Frequently, in the course of operation, he opened the uterine cavity to avoid overlooking a tumor. He emphasized the advisability of removing all myomas and illustrated his opinion by stating that in one case he removed 125 separate tumors. Significant uterine myomas appeared subsequent to myomectomy in 30 per cent of our 250 cases. Further treatment was required in 20 per cent of the 250 cases. The chance that further treatment may be necessary will have to be assumed by the patient in

exchange for the attempt to preserve the function of reproduction. It is interesting to note that those patients who did not become pregnant after myomectomy showed a slightly higher incidence of "recurrence" than did those who subsequently became pregnant.

A brief résumé of the cases in which myomectomy was performed in the course of pregnancy has been given in order to emphasize two points. First, in the course of pregnancy complicated by uterine myomas, conditions may arise which require surgical treatment. Second, myomectomy does not carry undue risk for the pregnant women but the fetal mortality is high; in twenty-three cases of intra-uterine pregnancy in this series, only ten infants survived. Because of relatively high fetal mortality, removal of myomas from the pregnant uterus should be done only in cases in which the indications are compelling.

A salvage of 128 children in 167 instances of pregnancy in 101 women, who previously, had undergone uterine myomectomy instead of hysterectomy or irradiation for fibroids, seems to justify myomectomy in selected cases in which the patients are women of the childbearing age. It is recognized that after myomectomy patients run more risk of remote postoperative complications, such as intestinal obstruction, than they do after hysterectomy, which can be accompanied by peritonealization.

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DISCUSSION

Dr. Herbert E. Schmitz, Chicago, Ill.—When fibromyomata of the uterus cause symptoms which necessitate surgical intervention for their relief, the age of the patient must influence the surgical procedure performed. In many cases it is necessary to preserve the menstrual function because of the psychic depression which is produced in a young woman by the loss of her menses and her childbearing availability. Myomectomy for the relief of sterility should be considered only if the lesion is an obstruction to the ovum or is responsible for menstrual disturbances and the resultant endometrial chnages, and after all other studies have failed to reveal the cause of the infertility. Great care must be exercised in those cases of increased bleeding as this may be an endocrine imbalance in which the associated myoma plays no part. Unless

the myoma disturbs the endometrium because of its close proximity or direct interference, it most likely is not responsible for the menstrual disturbance.

That pregnancy will follow myomectomy is shown by the statistics of the authors. If we were given more data about previous fertility studies in these eight cases and the associated pathologic changes found at the time of operation, other causes responsible for the infertility might be revealed. We should hesitate to advise myomectomy for the relief of sterility if other indications for surgical therapy do not exist. Campbell, in his report of a series of cases from the Johns Hopkins Clinic, has shown that pregnancy may exist in a myomatous uterus with little serious disturbance during pregnancy or the first stage of labor. The incidence of forceps delivery was higher in the second stage, and in the third stage postpartum hemorrhage, adherent and retained placenta were found to occur more frequently. During the puerperium involution was often delayed.

Myomectomy during pregnancy should be reserved for those cases showing definite symptoms of degeneration of the tumor because of interference or disruption of blood supply. Pain or tenderness over a tumor without other signs of degeneration, or the finding of a tumor should not be considered as cause for surgical interference. If the tumor is obstructive because of its location in the pelvis, the patient should be carried to term and then have the tumor removed at the time of section.

The slightly higher incidence of complications occurring with pregnancy following myomectomy should not influence our choice of the procedure. As stated by the authors, "With modern obstetric and surgical care the increased risk certainly is not prohibitive."

Dr. Emil Novak, Baltimore, Md.—It is quite generally agreed that in some as yet unknown fashion myomata of the uterus tend to produce at least a relative infertility. On this point my viewpoint is different from that of Doctor Schmitz, because I believe that myomectomy is not infrequently indicated in the case of young women who are extremely anxious for children, and in whom careful study has apparently eliminated other causes of sterility. Anyone who has carried out this procedure in any great number of cases must have been impressed with the considerable proportion of successes which it yields, pregnancy often occurring rather promptly following operation, following even years of sterility. Certainly the justification for myomectomy even with tumors which are symptomless except for the associated sterility is far greater than, for example, the performance of tubal plastic procedures in sterility due to tubal closure. Even these are justified if, but only if, the patient understands fully the slimness of her chances. A further advantage of myomectomy for this indication is that these tumors undoubtedly in some cases predispose to miscarriage in the event of pregnancy. Finally, if myomectomy is not done, the tumors may later show such increase in size and number that hysterectomy rather than myomectomy may be considered necessary, and the patient's chances for children are forever lost.

While in most myomectomies we deal chiefly with intramural or subperitoneal growths, we should not hesitate to invade the uterine cavity should this be necessary. In one of my patients a vaginal hysterectomy was done for a rather large submucous growth, but the operation revealed numerous other growths, submucous or interstitial, which could be peeled out from within the uterus. It seemed that practically all the endometrium was removed, and yet this woman

became pregnant within a few months, and was later safely delivered by cesarean section.

DR. JAMES E. DAVIS, Ann Arbor, Mich.—The position of the myoma may determine the safety of its removal. Some subserous myomata can be removed as easily as warts from the skin surface. The blood supply of the tumor may determine the safety of its removal. The histologic structure may also have an important bearing upon the safety. A myoma that is degenerating may be quite safe to remove. One that has a rich blood supply, is composed of rich muscle structure and is in a position to interfere with the continued normal physiology of the uterus, cannot be removed very easily nor with much safety.

DR. ROBERT D. MUSSEY, Rochester, Minn. (closing).—I have nothing further to add. I wish to thank those who have discussed the paper.